

Claims

1. A method of applying a braking force to a wheel of an aircraft moving along the ground, the method comprising the steps of

estimating the conditions at which the wheel would skid, the estimating step taking into account the vertical load transmitted between the ground and the wheel, and

applying a braking force to the wheel in dependence on the results of the estimating step.

2. A method according to claim 1, wherein the braking force is applied at a level at which it is judged that the conditions for skidding will not be met whilst maintaining effective braking.

3. A method according to claim 1 or claim 2, wherein the estimating step includes taking into account a variable relating to the braking force to be applied.

4. A method according to any preceding claim, wherein the estimating step includes taking into account a variable relating to time, whereby estimating the conditions at which the wheel would skid includes estimating when the wheel is likely to skid.

5. A method according to any preceding claim, wherein the estimating step includes the performance of a calculation, in which a parameter relating to the vertical load transmitted between the ground and the wheel is taken into account.

6. A method according to claim 5, wherein a slip parameter is taken into account when performing the calculation, the

slip parameter being such that the amount of slip between the ground and the wheel and the slip parameter are interrelated.

7. A method according to claim 6, wherein data is ascertained regarding the relationship between slip and the ground to wheel friction coefficient and at least some of the data so ascertained is used in the calculation.

8. A method according to claim 6 or claim 7, wherein the method includes recording, over time, data relating to the relationship between the value of the friction coefficient and the value of slip.

9. A method according to claim 8, wherein a control unit controls the braking force applied such that the level of slip nears, but does not exceed, a level at which unstable braking starts, the control unit using the recorded data in order to assess the point at which unstable braking starts.

10. A method according to any of claims 6 to 9, wherein the method includes ascertaining the slip parameter relating to the slip between the ground and the wheel by means of measuring parameters relating to the aircraft speed and the speed of the periphery of the wheel.

11. A method according to any preceding claim, wherein the method includes a step in which a prediction is made regarding how the vertical load will change and the prediction is taken into account when performing the estimating step.

12. A method according to any of the preceding claims, wherein the method is so performed that, if a skid is detected, the braking force is reduced in a way that takes

into account data relating to the vertical load transmitted between the ground and the wheel.

13. A method according to any of the preceding claims, wherein the brakes are actuated by means of a hydraulic system, and the method includes a step of ascertaining a parameter representative of the hydraulic pressure in the brake system, the method including a step of calculating the braking force to be applied to the wheel, the parameter being taken into account when performing that calculation.

14. A method according to claim 13, wherein the method includes a step of estimating how the braking force applied changes with changes in other variables and varying the braking pressure applied to account for the changes in such other variables.

15. A braking control apparatus for controlling the braking of an aircraft wheel and a processor associated with the braking control apparatus, the apparatus being connectable to the brakes of at least one wheel of an aircraft and the processor being able to be connected to receive in use signals relating to the vertical load transmitted between the ground and the aircraft wheels, the processor being so arranged that in use it performs a calculation using data derived from the signals received by the control apparatus and estimates the conditions at which the wheel would skid, the estimating step taking into account the vertical load transmitted between the ground and the wheel, wherein the control apparatus is so arranged that in use the control apparatus actuates the brakes in dependence on the results of the calculation performed by the processor, whereby the control apparatus is able to control the actuation of the brakes taking into account the

vertical load and other conditions that affect the likelihood of skidding.

16. A control unit and a landing gear assembly for an aircraft, the assembly including at least one aircraft wheel, the control unit being able in use to actuate the brakes of said at least one wheel, the control unit including a processor, which is connected to receive data signals relating to the vertical load transmitted between the ground and the aircraft wheels, and which in use performs a calculation using data derived from the data signals received by the processor and estimates the conditions at which the wheel would skid, the estimating step taking into account the vertical load transmitted between the ground and the wheel, wherein the control unit is so arranged that in use the control unit actuates the brakes in dependence on the results of the calculation performed by the processor.

17. An aircraft including a braking control apparatus and processor according to claim 15 or a control unit and a landing gear assembly according to claim 16.